

Initial Risk-Based Prioritization of High Production Volume Chemicals

Chemical/Category: Dichloroacetyl chloride (DCAC) CAS No. 79-36-7

Supporting Chemicals: Dichloroacetic acid (DCA) CAS No. 79-43-6

Monochloroacetic acid (MCA) CAS No. 79-11-8

This document is based on screening-level characterizations done by EPA on the environmental fate, hazard, and exposure of the listed chemicals. The information used by EPA includes data submitted under the HPV Challenge Program¹ and the 2006 Inventory Update Reporting (IUR)², and data publicly available through other selected sources³. This screening-level prioritization presents EPA's initial thinking regarding the potential risks presented by these chemicals and future possible actions that may be needed. These initial characterization and prioritization documents do not constitute a final Agency determination as to risk, nor do they determine whether sufficient data are available to characterize risk. Rather, they are interim evaluations. Recommended actions may be considered by EPA in the future based on a relative judgment regarding this chemical in comparison with others evaluated under this program, and in light of the uncertainties presented by gaps in the available data that may be determined to exist. These evaluations contribute to meeting U.S. commitments under the chemicals cooperation work being done in North America⁴.

Human Health and Environmental Hazard Summary:

- Available health effects studies indicated low oral toxicity, but DCAC's corrosive properties make it a severe skin and eye irritant and it produces moderate inhalation and dermal toxicity. Repeated-dose studies with DCAC and DCA indicate toxicity via all routes of exposure in a variety of organ systems. DCAC has the potential to cause reproductive and developmental toxicity, carcinogenicity, and mutagenicity.
- Available aquatic toxicity studies (using the analog MCA) indicate low toxicity to fish and invertebrates, but high toxicity to aquatic plants.

Persistence and Bioaccumulation Summary:

- DCAC and its supporting chemicals DCA and MCA are all ranked low for the potential to persist. DCAC is highly volatile and hydrolyzes rapidly to form hydrochloric acid (HCl) and DCA which biodegrades rapidly.
- DCAC and its supporting chemicals DCA and MCA are all ranked low for the potential to bioaccumulate.

Exposure Summary:

- Both IUR Confidential Business Information (CBI) and non-CBI information from IUR and other sources were used in this initial prioritization.
- Production volume: DCAC is an HPV chemical and was manufactured (including imported) in the U.S. in 2005 in amounts ranging from 1 million to 10 million pounds

¹ US EPA, HPV Challenge Program information: <http://www.epa.gov/hpv/>.

² US EPA, IUR Reporting information: <http://www.epa.gov/oppt/iur/index.htm>.

³ US EPA, Information on additional public databases used: <http://www.epa.gov/hpvis/pubdtsum.htm>.

⁴ US EPA, U.S. Commitments to North American Chemicals Cooperation:
<http://www.epa.gov/hpv/pubs/general/sppframework.htm>.

- Uses: Information provided in the HPV Challenge submission indicates that DCAC is manufactured in closed systems and shipped to customers for use as a chemical intermediate in the synthesis of other products.
- General Population and Environment: DCAC is not reported on the Toxics Release Inventory (TRI). However, processes for manufacturing and processing DCAC are closed, suggesting limited releases during manufacturing and processing. Any DCAC released would not be expected to persist due to its rapid hydrolysis and biodegradation of the DCA hydrolysis product.
- Workers: Based on IUR reporting, the total number of workers reasonably likely to be exposed to DCAC during manufacturing and industrial processing and use is believed to be less than 100. There may be additional potentially exposed workers that are not included in this estimate since not all workers engaged in industrial processing of this chemical have been accounted for. Processes for manufacturing and processing DCAC are closed, limiting releases during manufacturing and processing. Because DCAC rapidly hydrolyzes to form strong acids, potentially exposed workers are presumed to wear personal protective equipment which would further minimize exposure to DCAC. DCAC does not have an OSHA Permissible Exposure Limit.
- Commercial Workers and Consumers: There were no commercial or consumer uses identified in the IUR data or in the additional non-CBI data sources searched for the exposure characterization.
- Children: As described above for commercial and consumer products, DCAC is not expected to be present in children's products.

Assumptions and Uncertainties:

- Minor uses are not reported under the IUR, and are thus unknown.

Risk Characterization Summary:

- Potential Risk to Aquatic Organisms from Environmental Releases (LOW CONCERN): The potential for DCAC to be released to the environment is expected to be low and would likely be mitigated due the following: its chemical properties (corrosive); environmental fate properties (hydrolyzes and biodegrades quickly, is not persistent); and use pattern (chemical intermediate used to synthesize other products). The potential hazard to aquatic plants is high but the potential exposure from environmental releases is low, suggesting a low concern for potential risk to aquatic organisms.
- Potential Risk to the General Population from Environmental Releases (LOW CONCERN): The potential for DCAC to be released to the environment is expected to be low based on the reasons stated above. Thus, although the potential hazard to human health is high, potential exposure from environmental releases is low, suggesting a low concern for potential risk to the general population.
- Potential Risk to Workers (LOW CONCERN): There is potential for skin and eye irritation to occur as a result of worker exposure from DCAC use as a chemical intermediate or in the event of accidental release. However, because DCAC is rapidly hydrolyzed upon contact with water to form strong acids, it is presumed that potentially exposed workers wear personal protective equipment. Thus, although the potential hazard to human health is high, the exposure issues (use as an intermediate, corrosive and

thus self-limiting in terms of personal protective equipment) suggest a low concern for potential risk to workers.

- Potential Risk to Commercial Workers and Consumers from Known Uses (LOW CONCERN): DCAC is not expected to be present in commercial and consumer products. Thus, although the potential hazard to human health is high, little or no exposure suggests a low concern for potential risk to commercial workers and consumers.
- Potential Risk to Children (LOW CONCERN): DCAC is not expected to be present in children's products. Thus, although the potential hazard to human health is high, little or no exposure suggests a low concern for potential risk to children.

Rationale Leading To Prioritization Decision:

- Although there appear to be gaps in exposure information, the hazardous effects of DCAC are expected to be mitigated by certain chemical properties. DCAC's rapid hydrolysis to DCA, which itself rapidly biodegrades, would be expected to limit environmental exposure, and its corrosivity limits its use to occupational settings where it is assumed that personal protective equipment will be used.
- Additional information clarifying existing controls on potential occupational exposure and whether there are any environmental releases could be useful to better characterize potential risks. However, such information would not be likely to change the overall indication that the concern for risks presented by DCAC does not appear to be significant in light of cautionary proper use information already available.

Prioritization Decision:

- LOW PRIORITY: Follow-up action not suggested at this time.

Supporting Documentation:

Screening-Level Risk Characterization: 3/13/2008

Screening-Level Hazard Characterization: 2/22/2008

Screening-Level Exposure Characterization: 3/14/2008